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GREER, BURNS & CRAIN
300 S WACKER DR
25TH FLOOR
CHICAGO, IL 60606

EXAMINER

SHERMAN, STEPHEN G

ART UNIT	PAPER NUMBER
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2629

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/783,440

Applicant(s)

YOSHIHARA ET AL.

Examiner

Stephen G. Sherman

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 6-8 are objected to because of the following informalities:

Claims 6-7 should be changed to recite proper grammar, for example, claim 6 states: "...center toward upstream and downstream in the data scanning direction," and claim 7 states: "...and is higher on downstream side than on upstream side."

Claim 8 recites the limitation: "a switching unit for **making** switching between a first method in which said light source is turned on between corresponding timings in respective beginning scanning of one or a plurality of times of first-half data scanning and one or a plurality of times of second-half data scanning within the predetermined period and a second method in which said light source is turned on between a start timing of beginning scanning of one or a plurality of times of first-half data scanning and an end timing of beginning scanning of one or a plurality of times of second-half data scanning within the predetermined period." This should be changed for clarification reasons to: "a switching unit for switching between a first method, in which said light source is turned on between corresponding timings in respective beginning scanning of one or a plurality of times of first-half data scanning and one or a plurality of times of second-half data scanning, within the predetermined period, and a second method, in which said light source is turned on between a start timing of beginning scanning of one or a plurality of times of first-half data scanning and an end timing of beginning scanning

of one or a plurality of times of second-half data scanning, within the predetermined period."

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 8 recites the limitations "beginning scanning," "first-half data scanning," and "second-half data scanning." There is insufficient antecedent basis for this limitation in the claim.

4. Claims 1 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation: "a switching unit for making switching between a first method in which said light source is turned on between corresponding timings in respective beginning scanning of one or a plurality of times of first-half data scanning and one or a plurality of times of second-half data scanning within the predetermined period and a second method in which said light source is turned on between a start timing of beginning scanning of one or a plurality of times of first-half data scanning and an end timing of beginning scanning of one or a plurality of times of second-half data

scanning within the predetermined period.” This is indefinite because from the claim it is unclear what is meant by “first-half data scanning” and “second-half data scanning.” These terms make it unclear as to whether during one data scanning period, each time the scanning lines are scanned the light source is turned on in the middle of the scanning, i.e. between the first half of scanning the data and the second half of scanning the data, or whether the data lines the light source is turned on after the end of scanning the data lines and before scanning the data lines again. For the purpose of examination, the examiner will take the position that both methods provide for a way to turn on the light source between scanning a first time and scanning a second time, and that the first method provides that the light source must be turned on sometime during the first scanning and turned off sometime during the second scanning, however, the second method allows for the light source to be turned on anytime beginning with the start of scanning a first time and the end timings of the second scanning.

Claim 1 recites similarly “a control unit for turning on said light source between corresponding timings in respective beginning scanning of one or a plurality of times of first-half data scanning and one or a plurality of times of second-half data scanning within the predetermined period,” and therefore is rejected for similar reasons as claim 8 is rejected.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 5 and 8-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al. (US 2002/0149576).

Regarding claim 1, Tanaka et al. disclose a liquid crystal display device comprising:

a liquid crystal panel (Figure 3, liquid crystal panel 10);

a light source for emitting light to be incident on said liquid crystal panel (Figure 3, light source 20, paragraph [0058] explains that that light emitted is incident on the liquid crystal panel.);

a synchronizing unit for synchronizing control of turning on said light source with data scanning based on image data to be displayed on said liquid crystal panel in each predetermined period (Figure 3 shows control circuit 36 receiving video signal 38 and paragraph [0061] explains that the control circuit 36 outputs a control signal to a backlight control circuit 37 to control the timing of the light source.); and

a control unit for turning on said light source between corresponding timings in respective beginning scanning of one or a plurality of times of first-half data scanning and one or a plurality of times of second-half data scanning within the predetermined period (Figure 3 shows backlight control circuit 37 and paragraph [0070] explains that

Figure 4C shows that the light source is turned on between the timing of the beginning of the first scanning and is turned off between the timing of the second half scanning shown in Figure 4A.).

Regarding claim 2, Tanaka et al. disclose the liquid crystal display device of claim 1, wherein the corresponding timing is a substantially intermediate time point in the respective beginning scanning (Figure 4C shows that the time point is intermediate, which is also explained in paragraph [0070].).

Regarding claim 5, Tanaka et al. disclose the liquid crystal display device of claim 1, wherein a brightness distribution of said light source is uneven in a data scanning direction (Figure 1 shows that the light source 21 is located on an end with respect to the liquid crystal panel, which will inherently result in the light distribution being uneven since the light intensity closer to the light source will be greater, which means that when the data is scanned, on the liquid crystal panel, there will be an unevenness of light.).

Regarding claim 8, Tanaka et al. disclose a liquid crystal display device comprising:

a liquid crystal panel (Figure 11, liquid crystal panel 10);

a light source for emitting light to be incident on said liquid crystal panel (Figure 11, light source 20);

a synchronizing unit for synchronizing control of turning on said light source with data scanning based on image data to be displayed on said liquid crystal panel in each predetermined period (Figure 3 shows control circuit 36 receiving video signal 38 and paragraph [0134] explains that the control circuit 36 outputs a control signal to a backlight control circuit 37 to control the timing of the light source.); and

a switching unit for making switching between a first method in which said light source is turned on between corresponding timings in respective beginning scanning of one or a plurality of times of first-half data scanning and one or a plurality of times of second-half data scanning within the predetermined period and a second method in which said light source is turned on between a start timing of beginning scanning of one or a plurality of times of first-half data scanning and an end timing of beginning scanning of one or a plurality of times of second-half data scanning within the predetermined period (Paragraph [0131] and [0133]-[0134]. As explain in these paragraph, different modes can be selected by a user or automatically selected, and these modes would control the timing of the backlight turning on. The control circuit 36 receives information regarding the timing set, and then sends the timing information to the backlight control circuit 37, i.e. the control circuit 36 switches between the different modes available. Also, since the user can select the on timing of the backlight, the user would be able to select timings such that the light source is turned on between corresponding timings in respective beginning scanning of one or a plurality of times of first-half data scanning and one or a plurality of times of second-half data scanning within the predetermined period, as that shown in Figure 4C, and the user could also select timings such that the

light source is turned on between a start timing of beginning scanning of one or a plurality of times of first-half data scanning and an end timing of beginning scanning of one or a plurality of times of second-half data scanning within the predetermined period, as that shown in Figure 4C or Figure 14C, which both are turned on between the start of the first scanning and the end of the second scanning.).

Regarding claim 9, Tanaka et al. disclose the liquid crystal display device of claim 1, wherein a liquid crystal material for use in said liquid crystal panel has spontaneous polarization (Paragraph [0171]).

Regarding claim 10, Tanaka et al. disclose the liquid crystal display device of claim 8, wherein a liquid crystal material for use in said liquid crystal panel has spontaneous polarization (Paragraph [0171]).

Regarding claim 11, Tanaka et al. disclose the liquid crystal display device of claim 1, wherein said light source emits light of at least three primary colors (Paragraph [0053]), and a color display is performed by switching the color of light emitted by said light source in a time-divided manner in synchronism with ON/OFF driving of switching elements (Figures 4A-4C).

Regarding claim 12, Tanaka et al. disclose the liquid crystal display device of claim 8, wherein said light source emits light of at least three primary colors (Paragraph

[0053]), and a color display is performed by switching the color of light emitted by said light source in a time-divided manner in synchronism with ON/OFF driving of switching elements (Figures 4A-4C).

Regarding claim 13, Tanaka et al. disclose the liquid crystal display device of claim 1, wherein said light source emits light of white color, and a color display is performed by selectively transmitting the light emitted from said light source through color filters of a plurality of colors (Paragraph [0056]).

Regarding claim 14, Tanaka et al. disclose the liquid crystal display device of claim 8, wherein said light source emits light of white color, and a color display is performed by selectively transmitting the light emitted from said light source through color filters of a plurality of colors (Paragraph [0056]).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 2002/0149576) in view of Yoshihara et al. (US 2002/0000960).

Regarding claim 3, Tanaka et al. disclose the liquid crystal display device of claim 1.

Tanaka et al. fail to teach wherein a voltage applied to said liquid crystal panel in one or a plurality of times of first-half data scanning and a voltage applied to said liquid crystal panel in one or a plurality of times of second-half data scanning are equal in magnitude and opposite in polarity.

Yoshihara et al. disclose of a liquid crystal display device wherein a voltage applied to said liquid crystal panel in one or a plurality of times of first-half data scanning and a voltage applied to said liquid crystal panel in one or a plurality of times of second-half data scanning are equal in magnitude and opposite in polarity (Figure 7(b)).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to make the voltages of the first and second half scanning taught by Tanaka et al. be opposite in polarity as taught by Yoshihara et al. in order to

provide for a period of time wherein liquid crystal is in a display state in each pixel to be equal to each other, and thus, no fluctuation in luminance occurs.

Regarding claim 4, Tanaka et al. disclose the liquid crystal display device of claim 1.

Tanaka et al. fail to teach wherein a darker display is obtained by one or a plurality of times of second-half data scanning compared to one or a plurality of times of first-half data scanning.

Yoshihara et al. disclose of a liquid crystal display device wherein a darker display is obtained by one or a plurality of times of second-half data scanning compared to one or a plurality of times of first-half data scanning (Figure 7(b) shows of having a first scanning and a second scanning, while Figure 12 shows of having multiple first scanning and multiple second scanning, where the second scanning is used for erasing by applying a negative polarity voltage, meaning that a darker display will be accomplished by the second scanning periods.).

Therefore it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to make the voltages of the first and second half scanning taught by Tanaka et al. be opposite in polarity as taught by Yoshihara et al. in order to provide for a period of time wherein liquid crystal is in a display state in each pixel to be equal to each other, and thus, no fluctuation in luminance occurs.

10. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 2002/0149576) in view of Nitto et al. (US 2003/0123258).

Regarding claim 6, Tanaka et al. disclose the liquid crystal display device of claim 5.

Tanaka et al. fail to teach wherein the brightness of said light source is lowest in a center in the data scanning direction and increases from the center toward upstream and downstream in the data scanning direction.

Nitto et al. discloses a liquid crystal display device wherein the brightness of a light source is lowest in a center in the data scanning direction and increases from the center toward upstream and downstream in the data scanning direction (Figures 10-11 shows that there is a light source at the top and the bottom of the display, where inherently the light intensity will degrade as the light is further from the source, thus resulting in the light intensity on the two edges of the panel being the greatest and the intensity in the middle being the lowest.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the idea of having two incident light sources as taught by Nitto et al. in the liquid crystal display device taught by Tanaka et al. in order to provide for better light distribution for having better light uniformity across the display surface.

Regarding claim 7, Tanaka et al. disclose the liquid crystal display device of claim 5.

Tanaka et al. fail to teach wherein the brightness of said light source is lowest in a center in the data scanning direction, increases from the center toward upstream and downstream in the data scanning direction, and is higher on downstream side than on upstream side (Figures 10-11 shows that there is a light source at the top and the bottom of the display, where inherently the light intensity will degrade as the light is further from the source, thus resulting in the light intensity on the two edges of the panel being the greatest and the intensity in the middle being the lowest, and since the intensity of the light sources can be changed and the lights can degrade, the brightness of the bottom light sources can be greater than that of the top light source.).

Therefore it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to use the idea of having two incident light sources as taught by Nitto et al. in the liquid crystal display device taught by Tanaka et al. in order to provide for better light distribution for having better light uniformity across the display surface.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yoshihara et al. (US 2001/0052891) disclose a liquid crystal display device including a liquid crystal panel having a plurality of liquid crystal pixels and a plurality of switching elements provided to correspond to the respective liquid crystal pixels; a backlight, disposed on the rear face of the liquid crystal panel, for emitting red, green and blue lights in a time0divided manner; and a data driver and a scan driver for switching the respective switching elements according to red, green and blue data of the respective pixels, in which the light emitting area of the backlight is divided into a plurality of light emitting areas and the intensity of light to be emitted from each of the divided light emitting areas is adjusted by a backlight control circuit and drive power source so as to compensate for difference in the light transmittance of the liquid crystal panel.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

1 February 2007

AMR A. AWAD
SUPERVISORY PATENT EXAMINER
